


CLAIMS

 1. A water-based pigment dispersion in which a pigment is dispersed with a thermoplastic resin containing a water soluble or self-emulsifying carboxylic group, characterized in that the ratio of the pigment to the thermoplastic resin containing the carboxylic group (pigment/thermoplastic resin containing carboxylic group (weight ratio of effective solid matter)) is 10/10 to 10/1, the thermoplastic resin containing the carboxylic group is cross-linked with a cross-linking agent after the pigment is dispersed with the thermoplastic resin, and the ratio of the cross-linking agent to the thermoplastic resin containing the carboxylic group (cross-linking agent/thermoplastic resin containing carboxylic group (weight ratio of effective solid matter)) is 1/100 to 50/100.

2. The water-based pigment dispersion of Claim 1, wherein the thermoplastic resin containing a water soluble or self-emulsifying carboxylic group is an acrylic resin or a polyurethane, and the thermoplastic resin has number average molecular weight of 2000 to 20000 and acid value of 30 to 300.

3. The water-based pigment dispersion of Claim 1, wherein the cross-linking agent is an aqueous polymer of which reaction point for cross-linking is carboxylic group.

4. The water-based pigment dispersion of Claim 1, wherein



2 the cross-linking agent is an aqueous oligomer containing (meth)acryloyl  
3 group.

1 5. The water-based pigment dispersion of Claim 1, wherein  
2 the thermoplastic resin containing the carboxylic group before  
3 dispersion is neutralized with an organic amine and the organic amine  
4 has boiling point of at most 200°C.

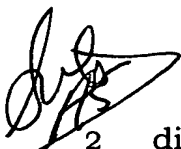
1 6. The water-based pigment dispersion of Claim 1, wherein  
2 the thermoplastic resin containing the carboxylic group, which is  
3 cross-linked, has gel percent of at least 30 % and number average  
4 molecular weight of more than 100000.

1 7. The water-based pigment dispersion of Claim 1, wherein  
2 the pigment which is dispersed has average particle size of at most 200  
3 nm, and  
4 the absorbancy ratio of the dispersion calculated in accordance with the  
5 equation (I):

6 Absorbancy ratio

$$= \frac{\text{Absorbancy of supernatant liquid after centrifugal treatment}}{\text{Absorbancy before centrifugal treatment}} \times 100 \quad (\text{I})$$

7 in which centrifugal treatment is carried out under the condition of 8000  
8 revolution/5 min. and 10000 G, and the absorbancy is a measured  
9 value of top peak in a diluted solution prepared by diluting 1 g of the  
10 pigment amount with 5 L of ion-exchange water is 10 to 100.

 8. A process for preparing the water-based pigment dispersion of Claim 1, characterized in that the process comprises

- (1) a step for predispersing a pigment and a thermoplastic resin containing a water soluble or self-emulsifying carboxylic group to give a mixture,
- (2) a step for treating the mixture by a dispersing machine and dispersing the pigment with the thermoplastic resin containing the carboxylic group to give a dispersion,
- (3) a step for cross-linking the thermoplastic resin containing the carboxylic group in the dispersion with a cross-linking agent, and
- (4) a step for adjusting pH of the dispersion containing the pigment and the thermoplastic resin containing the carboxylic group, which is cross-linked, to alkaline range,

wherein pH of the dispersion at finishing cross-linking reaction is 6.0 to 8.0.

9. A water-based ink containing the water-based pigment dispersion of Claim 1.